



Bio-intensive Integrated Pest Management in Chrysanthemum

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The floriculture industry is experiencing significant growth in India, driven by substantial commercial and aesthetic requirements. Chrysanthemum is a crucial crop for loose flower production, cultivated extensively by small and marginal farmers in open field conditions. The plant faces significant challenges from insect pests, leading to substantial reductions in marketable yield. Studies on pest complexes affecting Chrysanthemum have been conducted in various countries, particularly where floriculture plays a prominent role in agriculture. Details of pests attacking chrysanthemum and their nature of damage are mentioned in Table 1.

Table 1. Common pests of chrysanthemum and their nature of damage

SN	Name of the pest	Plant part affected	Nature of damage
1	Chrysanthemum bud borer: <i>Helicoverpa armigera</i>	Buds and flowers	Feed on bud and flower portion and cause marketable losses
2	Leaf caterpillar: <i>Spodoptera litura</i>	Leaves, tender portion of plants and flower buds	Defoliation during vegetative stages & flower damage during flowering stage
3	Bihar hairy caterpillar: <i>Spilosoma obliqua</i>	Leaves, tender portion of plants and flower buds	Defoliation during vegetative stages & flower damage during flowering stage
4	Aphid: <i>Macrosiphoniella sanborni</i>	Tender portion of the stem and flower buds	Suck the sap from the tender portion of the plant, reduce the plant vigour, directly responsible for yellowing and stunting of the plants and shriveled flower buds
5	Thrips: <i>Microcephalothrips abdominalis</i> and <i>Frankiniella</i> sp.	Tender leaves, stem, buds and flowers	Scrapping the plant surfaces and reducing market value of the products. Vector of tospoviruses

6	Mealybugs: <i>Maconellicoccus hirsutus</i> <i>Ferrisia virgata</i>	Tender portion of the stem and flower buds	Suck the sap from the tender portion of the plant, reduce the plant vigour, directly responsible for yellowing and stunting of the plants and shriveled flower buds
3	Whiteflies, <i>Bemisia tabaci</i>	Shady portion of the plant branches	Suck the sap from the tender portion of the plant, reduce the plant vigour, directly responsible for yellowing and stunting of the plants and also transmit viral diseases

(Sources: Anonymous 2022; Prabha et al., 2019; TNAU 2016; IIHR FAQ: <https://www.iihr.res.in/faq>)

Eco-friendly management of major pests of chrysanthemum:

- Awareness to farmers regarding pest's life cycle and reliable pest diagnosis:*
 - This emphasizes educating farmers about the life cycles of pests and how to accurately identify them. Knowing the pest's life cycle helps in timing control measures effectively.
- Regular collection and destruction (at 15 day's interval) of Spodoptera & BHC egg masses & gregarious larvae during vegetative stages:*
 - This involves physically removing and destroying egg masses and clusters of larvae of pests like Spodoptera and BHC every 15 days during the early growth stages of the crop.
- Fix Yellow sticky traps @ 100/ha for sucking pests:*
 - Yellow sticky traps are used to monitor and trap flying insects, particularly sucking pests like aphids, whiteflies, and leafhoppers. Placing 100 traps per hectare helps in early detection, monitoring and mass trapping of pest populations.
- Encourage natural enemies in the field and avoid use of synthetic pesticides considering Pest: Defender ratio in the field*
 - Promoting natural enemies such as predatory insects, parasitoids, and beneficial microorganisms helps in controlling pest populations naturally. Maintaining a balance (Pest: Defender ratio) ensures that natural predators can effectively keep pest populations in check without the need for synthetic pesticides.
- Avoid excess use of nitrogen, as it makes plants susceptible to sucking pests:*
 - Nitrogen fertilization affects plant physiology and can influence susceptibility to pests, especially sucking pests. Excessive nitrogen can lead to lush growth that attracts pests like aphids and mites.
- Two sprays at a 15 days' interval of neem oil-based formulation of Azadirachtin 1 EC @ 0.1% mixed with organo-trisiloxane surfactant @ 0.025% for aphids & thrips during vegetative & bud formation stage:*
 - Neem oil containing Azadirachtin is a botanical insecticide effective against aphids and thrips. Spraying at specific intervals during vegetative and early bud stages targets these pests effectively.
- Regular harvesting of flowers to minimize pest load in the field:*
 - Regularly harvesting flowers reduces the availability of food and shelter for pests, thereby lowering pest populations in the field.

These practices collectively form an integrated approach to pest management in chrysanthemum, combining cultural, biological, and chemical control methods. The aim is to reduce reliance on synthetic pesticides while effectively managing pest populations to ensure crop health and yield. Each practice is tailored to specific pests and growth stages of the crop, optimizing control measures while minimizing environmental impact.

References

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